

We claim:

1. A method for correcting the figure of a substrate, comprising:
measuring the figure of a surface of said substrate;
applying a figure-correcting layer to a surface of said substrate;
locally adjusting the thickness of said figure-correcting layer; and
measuring the thickness of said figure-correcting layer.

2. The method of claim 1, further comprising iterating between the
steps of locally adjusting the thickness of said figure-correcting layer and
measuring the thickness of said figure-correcting layer until a desired figure is
obtained.

3. The method of claim 1, wherein said figure-correcting layer
comprises an index of refraction that is nearly the same as the index of refraction
of said substrate.

4. The method of claim 3, further comprising applying a marker layer to said substrate before applying said figure-correcting layer, wherein said marker layer is located between said substrate and said figure-correcting layer.

5. The method of claim 1, wherein the step of measuring the figure of said substrate is carried out with a phase shifting diffraction interferometer.

6. The method of claim 1, wherein the thickness of said figure-correcting layer is known.

7. The method of claim 1, wherein said figure-correcting layer comprises an index of refraction that is different from the index of refraction of said substrate.

8. The method of claim 1, wherein said figure-correcting layer comprises an optical material having embedded material selected from the group consisting of Al, Cr, Co, Ni, Ti, Mo, and Si.

9. The method of claim 1, wherein the step of locally adjusting the thickness of said figure-correcting layer is carried out with a beam selected from the group consisting of an electron beam, an ion beam and an electromagnetic beam.

10. The method of claim 9, wherein said electromagnetic beam comprises light selected from the group consisting of visible light, ultraviolet light, infrared light and x-ray light.

11. The method of claim 1, wherein the step of measuring the thickness of said figure-correcting layer is carried out with an optical method selected from the group consisting of interferometry and reflectance spectroscopy.

12. The method of claim 1, wherein the step of measuring the thickness of said figure-correcting layer is carried out with fluorescence.

13. The method of claim 1, wherein the step of measuring the thickness of said figure-correcting layer is carried out with ultrasound.

14. The method of claim 1, further comprising comparing said thickness of said figure-correcting layer to said figure of said surface of said substrate to determine the figure of the substrate in combination with said figure-correcting layer.

15. The method of claim 1, wherein the step of locally adjusting the thickness of said figure-correcting layer comprises adding material to said figure-adjusting layer.

16. The method of claim 1, wherein the step of locally adjusting the thickness of said figure-correcting layer comprises removing material from said figure-adjusting layer.

17. The method of claim 1, wherein the step of locally adjusting the thickness of said figure-correcting layer comprises adding material to said figure-correcting layer and removing material from said figure-correcting layer.

18. The method of claim 1, wherein the step of locally adjusting the thickness of said figure-correcting layer is carried out with a polishing tool.

19. The method of claim 1, wherein the step of measuring the thickness of said figure-correcting layer is carried out at a plurality of points simultaneously.

20. The method of claim 19, wherein the step of measuring the thickness of said figure-correcting layer at a plurality of points simultaneously is carried out with a two-dimensional detector.

21. The method of claim 1, wherein the step of measuring the figure of said surface of said substrate is carried out prior to the step of applying a figure-correcting layer to a surface of said substrate.

22. The method of claim 1, wherein the step of measuring the figure of said surface of said substrate is carried out after the step applying a figure-correcting layer to a surface of said substrate.

23. A method for correcting the figure of a substrate, comprising:
applying a figure-correcting layer and an interface to a surface of said substrate, wherein said interface is between said substrate and said figure-correcting layer; and

locally adjusting the thickness of said figure-correcting layer to produce a desired surface figure.

24. The method of claim 23, further comprising measuring the figure of said substrate either before or after the step of applying a figure-correcting layer.

25. The method of claim 24, further comprising measuring the thickness of said figure-correcting layer.

26. The method of claim 25, further comprising iterating between the steps of locally adjusting the thickness of said figure-correcting layer and measuring the thickness of said figure-correcting layer until a desired figure is obtained.

27. The method of claim 23, wherein said figure-correcting layer comprises an index of refraction that is nearly the same as the index of refraction of said substrate, wherein said interface comprises a marker layer.

28. The method of claim 23, wherein said figure-correcting layer comprises an index of refraction that is different from the index of refraction of said substrate.

29. The method of claim 23, wherein the step of locally adjusting the thickness of said figure-correcting layer is carried out with a beam selected from the group consisting of an electron beam, an ion beam and an electromagnetic beam.

30. The method of claim 25, wherein the step of measuring the thickness of said figure-correcting layer is carried out with an optical method selected from the group consisting of interferometry, optical reflectance spectroscopy, ultrasound reflectance spectroscopy and fluorescence measurement.

31. The method of claim 23, further comprising comparing said thickness of said figure-correcting layer to said figure of said surface of said substrate to determine the figure of the substrate in combination with said figure-correcting layer.

32. The method of claim 23, wherein the step of locally adjusting the thickness of said figure-correcting layer is carried out with a step selected from

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